Mammalian target of rapamycin (mTOR) inhibition in chronic lymphocytic B-cell leukemia: a new therapeutic option.

Abstract:
Chronic lymphocytic B-cell leukemia (B-CLL) is an incurable disease characterized by the accumulation of monoclonal mature B cells, although disease progression relies upon cycling B-CLL cells in proliferation centers in central lymph organs. Rapamycin and its analogs are immunosuppressant drugs that exert their activity by specific inhibition of the mammalian target of rapamycin (mTOR). mTOR inhibition induces cell cycle arrest not only in normal lymphocytes but also in malignant cells. Therefore, rapamycins have recently entered the field of cancer treatment. In the present review we discuss how progression through the cell cycle is regulated in B-CLL cells and how rapamycin and its analogs can be used as target therapies against proliferating B-CLL cells. We also focus on additional effects of rapamycin, such as targeting the interaction between malignant B cells and the microenvironment.